Industrial FINISHING

Reg. U. S. Pat. Office

Devoted to Product Finishing in the Factory

Vol. XIV, No. 2 | DECEMBER, 1937 | $2.00 a Year

Contents of this Issue

Letters from Readers of Industrial Finishing 7
Finishes, Colors & Woods in Latest Furniture 12
Choosing Product Color 16
Newly Installed Equipment in a Stove Factory 21
Precautions to Observe When Using Black Baking Japan 25
Chemical Engineer Summarizes a Ten-Year Experience in Painting Storage Battery Containers—II 30
How A Service Man's Suggestions Wiped Out Six Troubles 40
What's New 44
Questions; Answers 52
Harmful Finger Prints on Metal to be Finished 62
Editorial 66

Burn-In Patching 19
Enduring Concrete Floor Paint 20
Fabric Covered Trailers 20
Filler—The Foundation of a Good Finish 23
Reclaiming Used Solvents 24
Illustrated Folder Shows How to Use Spray Guns 24
One-Bake Flexible Finish 24
Lacquer for Blanking and Forming 29
Shirt Shows Skeleton 39
Hose & Rubber Co. Opens New Office 39
Metal Cleaning Booklet Free 42
To Remove Excessive Moisture from Air 63
Wire Dipping Baskets 68
DeVilbiss Respirators 70
Rudd Lacquer & Sealer Corp. Organized in New York 70
"Neoprene"—Better Than Rubber 70
Tinted Pigment for O. S. Paints 70

"Classified Advertising" Section 71
Advertisers' Index 72

Published by

Practical Publications, Inc., 222 East Ohio St., Indianapolis, Indiana

Eastern Office: C. A. Larson, Mgr., 254 West 31st Street, New York City; Phone, Penna. 6-9040

Here is wishing every one
of you a very
MERRY CHRISTMAS
and a
HAPPY NEW YEAR

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THINNERS
ENAMELS
METALIZED FINISHES
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REASONABLE PRICES

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CLAREMONT, N. H.
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Letters from Readers

OF INDUSTRIAL FINISHING

Editor's Note — These letters have been promptly answered and all of the inquiries have been referred to advertisers in the magazine. They are published here to indicate or suggest certain interesting trends of thought and activity in the industry, and to encourage further inquiries, comments and suggestions. The names and addresses of firms or individuals whose letters are published here may be had by writing to this office, or letters sent to them in care of this office will be forwarded at once.

Paint Measuring Meter

On page 48 of the August issue you have an article about a paint measuring meter. We would like to know the name and address of the company making this instrument.—J. Toy Mfg. Co.

It's Buffalo Meter Co., 2917 Main St., Buffalo, N. Y.—Ed.

Lacquer Size for Flock

Where can I procure a silk screen printing lacquer suitable for printing through the silk screen, and then to be flocked? This lacquer must be pliable, colored and capable of holding a good body of flock. Any information you can give me through your magazine or by mail will be greatly appreciated.—L. L. R.

Coating Machines

Will you kindly furnish me with a list of the concerns who make coating machines, such as are used for Venetian blind slats.

I also need to know who makes the type of equipment used for dipping broom handles. I refer to the manual method where the handle is plunged down into a tube and then withdrawn through a grommet (gasket) that controls the film thickness. I would also like to ask if you know of anyone having used this machine for applying the finish to seamless tubing instead of wood handles. Of course, arrangements would have to be made to prevent the tube from filling up inside.

This letter is written only after leafing through a big stack of back issues of INDUSTRIAL FINISHING without finding just the right data.

Very often I find it possible to suggest, to concerns I call on, ideas and methods that have been written up in your swell little INDUSTRIAL FINISHING.—R. W. B.

Sound Deadening Paint

Will you please furnish us with a list of manufacturers of sound-absorbing coatings, such as are sprayed on the interiors of automobile bodies. —B. & K. Co.

Waterproofing Fiber

We notice in your Sept. issue, page 7, a letter from "J. E. R." inquiring after a waterproofing product for small fiber articles. As we are confronted with a similar problem — that of waterproofing black vulcanized fiber—we would like to learn whether this reader found the solution to his problem through you. We will appreciate any information you can give us on this.

Second Letter

We certainly appreciate your interest, which is shown by your full and complete letter of November 2nd.

Names to Remember

RUB-LESS LACQUERS

"SEALACQUER" SEALERS

FLO-SMOOTH THINNERS

WATEROIL STAINS

SEALTONE
(Comb. stain and sealer)

DOLCO REAL-FILL FILLERS

Liberal working samples on request.

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Solox dissolves all spirit soluble gums for Shellacs, Shellac Substitutes and for Spirit Varnishes

U. S. INDUSTRIAL ALCOHOL CO.

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Branches and Warehouses in All Principal Cities

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NEW YORK, N. Y.
World's Largest Producer of Alcohol Solvents

In order that you may fully appreciate the problem which we are attempting to overcome, we are forwarding you several samples of the raw fiber that we are attempting to waterproof — in the hope that you will pass this on to the proper person or concern. Perhaps by test, some method could be recommended to us that would solve our problem. —D. R. L. Co.

Etching Paste for Glass

Kindly advise if you can furnish use with names of manufacturers that make an etching ink or paste that can be silk screened on glass. We are using a product made locally called "screen etch" which doesn't seem to be very satisfactory, inasmuch as we would require the glass to be etched more effectively.—M. M. Co. (Metal Photo-Frames)

Striping Tools

We are interested in striping guns illustrated in the February issue of INDUSTRIAL FINISHING. There is one shown on page 38, at the bottom of the page; the other is on page 58 in the first column. Could you advise us where these guns can be obtained?—E. V. Co. (Novelties).

Thank you for your prompt attention and for your letter of November 1. We note that all the manufacturers of striping machines given us are in the central states or far west.

We appreciate the information you have given us and wonder if there are concerns manufacturing these machines closer to our Boston area. —N. & R. Co. (Chemical Engineers).

To Clean Hands

At the present time we spray some filigree items with black enamel, which is then relieved by hand by the use of a cloth impregnated with thinner. We find that the operators doing this work are having considerable trouble in that it is practically impossible to remove the black enamel from their hands . . . . it cuts pretty well into the pores of the skin due to the use of the thinner . . . . We are wondering if there is any solution, soap or device that can be used by the operators—possibly something they could put on their hands before or after this work which would eliminate this trouble? We shall be glad to have you put us

FILWHIRL

(Centrifugal)

ENAMELER

Wouldn't you like to coat as many as 120,000 to 225,000 articles, or parts, in an 8-hour day, as some are doing; and on small items, finish in quantities up to 600,000 per day? This method affects large savings in finishing materials, too. Learn more about this wonderful machine. Just send us samples of your product for coating in the FILWHIRL ENAMELER, and we will return them for your inspection. Write us TODAY!

THE LEON J. BARRETT CO.
Grafton Street, Worcester, Mass.

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DIP RACKS

this easy *Safe* way?

REMOVING paint accumulations from dip racks, conveyors or dollies need not be the difficult, time-consuming job you may think it is.

Neither need it be hazardous or unsafe!

Because you can now do this work easily.. SAFELY! No need to use inflammable solvents or costly paint removers. Here's why..a specially developed Oakite material quickly and thoroughly removes accumulations at low cost.

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in touch with any organization that may be supplying something of this kind.—H. A. Co. (Button Mfr.).

Yes indeed, there are several excellent preparations made especially for this purpose. Names and addresses of manufacturers are given in a letter.—Ed.

Matching Colors

Can you give us any information on methods or manufactured equipment to be used for matching paint colors?

We have a customer whose problem is to furnish wood heels finished with whatever color his customer's samples happen to have. At the present time he mixes paints until the desired result is obtained but this is a long and tiresome process.—L. E. M. Co. (Engineering, Sales, Installation).

To Mix Stains

You may be in a position to give us information as to where we can get a book on mixing stains and paints of different shades, as per color chart to be attached both in clear color and paints.

We find several books on the market with all kinds of descriptions and colors to be imagined, but these are not practical as colors must be seen to be appreciated, and exact formulas furnished.

Of course, there are all kinds of samples ready finished with the stains bottled on the shelf ready to take out, but the fixture and furniture business can not use them very well as they cost about three times as much as it costs to make them in the shop from different stain crystals for water or oil stain purposes.—R. O. A. Co. (Store and Office Fixtures).

Stain 20 Years Ago

I am seeking a pigment stain that was made by some firm in Chicago some 20 years ago. I have searched high and low trying to find out the name of this company. They made nothing but stains. Their walnut stain was noted for leaving a goldish effect on the finished product.

I would also like to ask if you know of any books published that go into the details of mixing stains and colors, also showing color plates of same using the present day materials.—C. L. H. (Bar Room Fixtures). *(Continued on page 65)*

DISPLAY OF STILLE-YOUNG FINISHES TO BE BROUGHT DIRECT TO YOUR DOOR

THE NEW STILLE-YOUNG (Trailer) Showroom—now on its initial trip—will make the rounds of the principal industrial territories.

A unique, novel and highly interesting exhibit of modern finishes—*brought to your very door.*

200 finishes on display (panels and—in many cases—complete finished pieces.)

Your own practical men—the men in charge of *producing* your finish—will derive many interesting suggestions from this new service.

This is Stille-Young cooperation *at first hand.*

Various territories will be covered in due course. On receipt of your inquiry we shall make a special effort to call on you with this exhibit at an early date.

THE STILLE-YOUNG CORPORATION

CHICAGO, ILLINOIS • HIGH POINT, NORTH CAROLINA

MANUFACTURERS OF

LACQUERS STAINS SEALERS FILLERS ENAMELS VARNISHES

Finishes, Colors & Woods

BY ROSALIE FLANK

LIKE THE FROSTING on a cake, new finishes at the fall National Home Furnishings Show at the American Furniture Mart attracted the attention of some 2,457 home furnishings buyers who came to market to fill their requirements and learn "What's new?" . . . .

Of particular interest to them was the return of bleached finishes in a new "toasted" tone, in lines that had six months before discarded them as being "dead."

As the modern trend mobilized to march back into reigning power, new recruits to the ranks included light finishes on 18th Century designs. Manufacturers, hesitating to bring out new modern designs, have taken to new finishes and upholstery to express the modern theme. Selecting Hepplewhite and Sheratone models, as well as some Classic numbers held over in the line, motifs and ornaments have been eliminated, round mirrors have been substituted for shields and fluted frames, and a bleach has been applied followed by careful glazing to achieve a warm "toasted" tone. The result is an American version of modern, resembling the beautiful Swedish

Walnut group; 18th century styling. The mellowed warmth of aged wood is recaptured in an exclusive "amber" finish. Hand-woven rush seats add to the charm of this unique ensemble.

ds in Latest Furniture . . . .

as exhibited in
November at the
American Furniture Mart

modern, but appealing to American taste that loves the simple designs of the English masters, served to them in a modern manner.

New Variations of Bleached and Light-Color Finishes

Crotches and burls have been selected as the recipient of the bleached finish, and where maple received all the glories of the "peroxide" era of the past year, walnut, mahogany and the standard cabinet woods now lend their distinctive grains to the new beauty of the glazed bleach.

A new wheat finish, used by one manufacturer of a modern maple line, has a color resembling ripened grain and is highlighted by bright colored upholstery in fruit and flower shades. It is a fact that modern maple is taking on a softer more subdued color which defies "turning" and meets with the approval of both the extreme modernists and the modern conservatives.

Pickled finishes were also finding a new popularity as pickled walnut and mahogany frames, resembling fruitwood, lent their

To emphasize the new "wheat" finish used on a line of modern maple furniture, one company displays a vase of real wheat on a modern desk finished in the new color . . . . Shown at the American Furniture Mart, Chicago, Ill.

beauty to French and English traditional living room chairs, love seats and divans—and the trend was picked up by smart novelty manufacturers who have begun to realize the merit of building occasional furniture to match upholstered pieces.

The new "pickled" finish consists of a bleach which is rubbed with pigment filler and glazed; thus a "briny" or "frosted" appearance is given the wood which retains, withall, its original grain. In some instances, the pickled finish was applied to entire case pieces but this was in exceptional

A symphony in unity, balance and design, this modern unit is cited as an excellent example of the new trend in modern design. The channeled back, horseshoe type chairs are upholstered in a novelty weave, blue and green mixture. The framework on the chairs and the unique bookcase-type end tables are of fawntone walnut.

instances and could not be regarded as a trend. In case pieces, manufacturers preferred to choose woods naturally light in color such as primavera, avadoire, curly maple, satinwood, aspen, acacia and others.

A number of manufacturers of 18th Century pieces went in for a patina or aged finish. This was particularly true on mahogany which has taken on a more red tone in many lines. Coined names are being used to distinguish the aged finish, "distressed" and "scarred" being accompanied by individual names used by the manufacturers. New samples arrived bearing the nicked and scratched finish which gave an antique feeling to the synthetically "aged" wood. Clever rubbing and highlighting helped to carry through the theme now reported to be in demand along the Eastern seaboard.

Aged Wood Effects

Walnut has had many variations applied to its original theme, one manufacturer producing a soft grey effect on a Swedish modern suite which bids fair to establishing a new trend. The suite was bleached, then brought back to a soft, true grey. No pigment glaze could be detected and the rich beauty of the wood in its natural state was clearly visible. There was a noticeable change in this greyed walnut from the hard rubbed finish usually associated with harewood. Solid walnut was used for the foot rail and head board on the bed, and solid parts on the vanity, dresser and chest. Seven-ply veneer, Tego bonded, made up the front and top sections.

French Provincial; Knotty Pine Oriental Wood; Oak

French Provincial, which has slowly but steadily crept into the heart of French designs, is expressed in a new fruitwood finish usually associated with this period of furniture design. One manufacturer has produced a French Provincial bedroom group in Rhode Island butternut—the soft mellow wood with its natural oily finish closely resembling the mel-

low fruitwood finish which added the charm of French furniture as interpreted by the provinces.

Knotty pine in its original finish was successfully employed on an 18th Century Hepplewhite bedroom and dining room group, the light wood adding a distinctly modern feeling.

Oriental wood combined with curly maple made up many versions of modern in the large volume lines; and zebra wood trims were noticed on suites that catered to bizarre tastes. However, more than ever before, furniture was more staid — manufacturers preferring simple designs with good finishes rather than more bizarre types of furniture that might carry a questionable sales appeal.

Volume lines in French dropped the gilt and enamel to appear in walnut with simple carved trims. Colonial finishes, now standardized, used new materials for upholstery to add distinction. In the light maple, however, a new finish resembling wood that had mellowed with many years of oiling and waxing carried a Revolutionary charm in its unusual finish that blended effectively with Colonial backgrounds.

Oak, which is again gaining national acceptance after remaining dormant for many years in some sections of the country, appeared in dining room lines in a new brown finish resembling polished walnut. The bulges and carving have been ironed out in many instances and the simplified designs bid fair to being awarded a good listing among the best sellers of 1938.

Juvenile furniture has switched in favor, in many instances, from natural birch and honey maple to colored enamel. Solid rose pink and true blue bring a new intensity and a modern note to juvenile ensembles.

Upholstery; Hardware; Cedar Linings

Upholstery has taken on a modern note; in many instances it has a silver or gold sheen which blends with the bleached and pickled frames. Stripes remain high in favor with modernized flower and scroll designs appearing on both traditional and modern pieces.

Hardware has become amazingly simple and has been moulded in accordance with the design. Considerable wood is being used as well as special metal pulls designed to fit the individual suites.

The volume lines include construction details that, in previous years, were only associated with the finest quality lines. Gadgets are being used on many vanities, dressers and chests, and secret compartments are becoming the order of the day. Cedar-lined cabinets continue to be built into wardrobes and vanities and hosiery compartments; jewelry drawers, built-in mirrors, electric clocks, indirect lighting and other convenience details are popular.

Many effective displays were employed to show the beauty of new woods and finishes. An effective display was made by a southern manufacturer who showed a typical bedrooom suite built in 1927 and a similar suite from the 1937 line. Although more than 100% decrease in cost has been worked out, the 1937 suite showed a decade of progress in styling, construction and finish as compared with the more expensive, older ensemble.

Choosing Product Color

by Howard Ketcham*
Color Engineer

What color or combination of colors will push the sales of your products higher? Colors in style are colors properly timed. Color engineering will answer your color problems, according to the author's talk given at the convention of the Natl. Paint, Varnish & Lacquer Association in Cincinnati, Oct. 28 and 29, 1937. Important features of that talk are included in this article.

TWENTY YEARS ago, color was little used in manufacture. 88% of the blankets sold were white; 95% of the fountain pens were black; and 100% of the Fords were black. Tableware was unornamented for the most part. Rooms, when painted, were in plain colors, and black prevailed in most items of merchandise. The absence of color in manufactured products tended to delay the appreciation of it. With the advent of the World War a color cycle commenced. Surplus profits financed experimentation with colors. The demand for color developed so rapidly that few manufacturers found time to give its application to their merchandise the consideration it merited. At that period color was considered in the nature of a temporary fad. All made haste to climb onto the band wagon before this natural vehicle for sales expired.

During this entire period the scientific aspect of color was ignored. As soon as industrial leaders realized that color had come to stay—that it represented a logical phase in the artistic development of the people, the consideration of pleasing combinations of color entered into practically every phase of industrial enterprise. Through such expressive mediums as color advertising, color moving pictures, color in merchandise, color has definitely come of age.

At last color is valued for something more than mere surface prestige. Its utilitarian value is recognized in its use to arouse desired degrees of emotional perspective. Its effectiveness in imparting power over form is seldom lost sight of in meeting the obsolescence factor in new lines of merchandise.

Many manufacturers have failed in their sales promotional efforts with color because of a too persistent attempt to push certain commodities in colors that fall short of the standards of taste of their average consumers.

*President, Howard Ketcham, Inc.

Color Styles Linked with Events of Past

Fashion and color style events of today are in reality connected by links with style events of the past. There is no such thing as a new color. That which appears new, is, in reality, evolved slowly from the traditions of the past. These traditions in human color preference transpire gradually. Most of the so-called Spring and Fall style seasons are merely arbitrary periods of color choice. Public fancy for color changes more often than twice a year. Tastes are undergoing continually a series of subtle changes. The colors that sell today are determined by watching and registering the streams of indications that flow from all sources—from paints, lacquers, advertisements, dress fashions, movies, fabrics and art.

These sources of color suggestions have their influence on the sales of all types of merchandise. Colors that sell today may lose much of their popularity—sales appeal—in tomorrow's market due to the subtle influences of some change in color taste. These changes in taste for colors have dangerous possibilities for any manufacturer or dealer in materials using color.

Color Surveys Give Accuracy Whereas Guessing Is Hazardous

The promsicuous introduction of new colors is fast giving way to a gauge of the public taste through color survey. This market testing, by largely eliminating the speculative element, reduces the risks of merely "guessing" at color tastes. Surveys have been conducted successfully on automobile colors on Spring and Summer suitings, on toiletware sets, on novelty Christmas trees, and on many other articles.

In the very early days of the automobile, surveys sponsored by a famous publisher hinted broadly that startling changes would take place in this plaything of the rich. Three events were forecast:

1) That about in 1909 car sales would be materially increased through national advertising. (It worked.)

2) That about 1914 car sales would be stimulated by installment selling (cash payments were the rule up to 1910).

3) That soon after 1920 color appeal would influence sales. (By 1929 each automobile builder had a color engineer.)

Surveys subsequently conducted under the auspices of the Automobile Color Index—the monthly publication of the Duco Color Advisory Service—predetermined many color trends. One of the most interesting of these du Pont surveys was to find out what color in a car the buyer actually wanted.

The survey was conducted by mail. Car buyers and prospects in a wide range of income groups were included, and were asked to make their choices from some 72 colors. It was plainly stated that their opinion only was desired; that no attempt would be made to sell them a car; that their names would not be used in any way in the survey. In spite of upsetting all precedents in the orthodoxy of surveys, this one was a success. More than 24% response was secured. Light, dusky and dark values in weak, vivid and strong purities of all colors suitable for outdoor exposure

were submitted. The results pointed clearly to a certain moroon that won instant acceptance.

Consumer Jury Selects Colors That Public Really Wants

The changing tastes for variations in the same color was dramatically emphasized by an incident that occurred at a meeting of our Color Coordination Committee of the National Retail Dry Goods Association. On a country-wide survey to predetermine the types of colors women would prefer for evening and daytime wear, certain variations of colors were indicated by a majority of the consumer jury and in two instances these variations differed from those promoted as leading colors by the stylist members. It was disclosed that the leading survey color swatches selected by the public in the course of my studies were stronger in purity in one instance and brighter in another.

Even though the promoted colors were successfully sold to the public, I pointed out that the acceptance would have been much greater probably had the exact variations been supplied to the 5,600 store-members of the National Dry Goods Association. As a result of this I was commissioned by one of New York's leading stores to select the brown color for fall suits, piece goods and accessories that would be most saleable. Using my Colorcable in the determination of these from my European sources, we developed and submitted 100 browns to homes in the income groups corresponding to those represented among the clientele served by this store. To the surprise of the officers in the store it was discovered that 84% of the people interviewed favored the same identical brown and when this was presented to the store buyers they were nonplussed because it was a color none had considered for fall merchandise.

The Colorcable used in the development of these browns is the device that transmits more than 300,000 visible colors over regular telegraph or cable communications. This machine, recently acclaimed by the nation's press as being of momentus importance to all who produce or use colors, makes it possible to send exact color information from any one place to any other place reached by wire or cable. Furthermore, with this machine it is possible to create an indefinite variety of colors, thus providing a rapid, precise and clean method of color creation adaptable to use by anyone who creates or deals in colors.

Where Surveys Can Be Misleading

But, careful planning of the color survey is really more important than the actual survey. Approaching the wrong people or in the wrong part of the country, or at the wrong season, or with an insufficiently representative range of colors, or a dozen more "wrongs" will be a waste of time and money—the results too will be wrong.

There is decided sales insurance to be had from information gained by the survey method—but here especially is it true that "a little knowledge is a dangerous thing."

Some research agencies feel that they have done a complete and authoritative job when they determine for a client just what colors the consumers appear to

prefer on certain items of merchandise. They may determine that people with incomes of $2500 a year or less prefer blue on a household utility costing $10; that those with incomes ranging from $2500 to $5000 prefer green on the same utility; and that those with incomes in excess of $10,000 prefer gray. They may feel that this is a sufficient analysis on which to forecast color appeal.

But the consumer jury is hypercritical. They know that there are many blue hues. Blue to them may mean greenish blues, purplish blues and pure blues.

The Color Engineer knows that in addition, each hue has high, middle and low values; and weak, moderate and strong chroma variations. Color reactions are not general. They are definitely specific to a certain hue value and chroma of a certain color. If a market analysis for color appeal is to be worth anything whatsoever it must determine the exact hue value and chroma desired. It is just as costly to be too far ahead of the color trend as it is unprofitable to lag behind it. So, the manufacturer or dealer who wishes to meet markets when they arrive does well to determine in advance the public choice in colors.

To achieve continued success in this constantly changing mass movement in color choice, manufacturers are obliged to keep abreast of the consciousness of the color consumer.

Color Engineering

To accomplish this consistently and efficiently, industry has adopted color engineering. With this help, a trend is maintained toward small and more active inventories. It has long been known that competition along lines of price, quality and workmanship has proved too limited, too profitless. It has served to stifle the opportunity to excel. There is, however, no limit to the variety of style combinations which the imagination is capable of creating with color.

We have learned comparatively recently that new, smart and attractive merchandise sells easier and at a better price than that which is merely useful or cheap. In all this the correct color has become the most important single factor, affording as it does an easy low-cost escape from standardization.

Burn-In Patching

IN THIS article I will describe the burning-in method and tools used by a firm that manufactures thousands of tables a year. This particular concern uses shellac and varnish as finishing materials.

After the tables are shellaced and have dried overnight, they are sanded with No. 4/0 sandpaper. Then they are inspected for holes, dents and open seams, and each faulty place is marked with a piece of chalk. Marked tables are moved to the patching bench. The materials and tools used here should be of help to anybody interested in patching finishes.

The burning-in knives are made of ordinary case knives such as you can buy at the dime store. About 1-in. is cut off the end; then the squared end is filed and rubbed across No. 6/0 sandpaper to smooth it. The handles are wrapped with tape so the operator can handle the knife while its

blade is hot. A typical burning-in knife, ready for service, is shown in Fig. 1. Electric heaters

Burning-in knife made from a case knife.

are used because they are much cleaner than an alcohol torch.

The shaver used to shave the patches smooth is made of a No. 10 file, one file being long enough to make two shaving tools like the one illustrated in Fig. 2. Each shaving tool is ground straight

Two views of shaver tool (made of a file) for shaving patches down.

across the end and beveled up about 1-in. along both sides. The beveled end is sharpened on a carborundum stone moistened with oil. The shaver is worked across the stone flatwise on the beveled end till it is sharp enough to shave a patch.

The finisher in this factory seems to prefer to use stick lacquer . . . . because, he says, "a lacquer patch does not raise so much when varnished . . . . "

The next operation is to drop the hot "cement" just a little ahead of the hole; then draw the knife across it quickly so it will not blister the shellac. Usually two or three passes with the knife are enough. The shaver is then used, pushing it forward or drawing it back over the patch, and cutting it close to the shellac. Fine sandpaper (No. 6/0) is used to sand the patch. Care must be taken to avoid sanding through the adjoining finish.

The tables are again inspected to make sure that all patches are sanded down smooth and even—and to see that none is burned through. Tables are then ready to varnish. The average burn-in man does about 125 to 150 tables per 8-hour day.—H. F. DEAN.

Enduring Concrete Floor Paint

In a booklet published by a very large manufacturer, we find some interesting facts about a line of paints for concrete floors and walls, as well as for plaster, stucco and brick. This paint is inert (unaffected) in the presence of alkali, therefore it can be applied to day-old concrete and can be repeatedly scrubbed with alkaline cleaning materials. In fact a scrub-testing machine was built to make comparative tests as to the endurance of this paint and others for concrete surfaces.

The machine simulates actual scrubbing conditions in that it utilizes an alkaline soap solution and a stiff, rough scrub-brush under a one-kilogram weight, pushing this brush over the painted surface. In this test the paints were applied on transit blocks with the stripes 1-in. wide across the panel.

The results of these tests showed that the paint under discussion here stands up very well under these severe conditions. The average life of its films was 200,000 strokes of the scrubbing brush, while other test finishes failed at 5,000 to 75,000 strokes.

The paint dries as quickly as lacquer, adheres tenaciously, and withstands abrasion—stands up under severe traffic indoors and outdoors.

Fabric Covered Trailers

The DuPont Style News Service reports that an all-lacquered fabric-covered trailer made by a firm in Pennsylvania is attracting attention . . . . and that there is a definite trend toward trailers with lacquered fabric on the outside. Reasons offered are that the fabric covering gives better insulation and is easy to keep clean. One trailer mentioned has fabric covering outside and inside—a heavy-textured red-lacquered fabric covering around the lower inside walls and a lighter-weight cream-colored fabric on the upper walls and ceiling.

Newly Installed EQUIPMENT *in a Stove Factory*

Editor's Note—Photographs and news about recent installations of uptodate equipment, in plants that apply finishing materials in production, are always welcome.

THE FOLLOWING pictures and data, furnished through courtesy of R. C. Mahon Co., Detroit, Mich., show and explain interesting views of a recently completed installation of spray booths, conveyors, ovens, etc., in the factory of the United Stove Co., Ypsilanti, Mich.

The finishing room proper is entirely enclosed and is supplied with clean filtered air through a perforated ceiling directly above the hydrofilter spray booth units (see Fig. 2). A slight down pressure of air is maintained in that section of the finishing room at all times.

The work is loaded onto a mesh conveyor which carries it through a two-stage washing machine (see Fig. 1) and a tunnel-type dry-off oven. The work is then unloaded from the mesh conveyor at a point convenient to three other continuous conveyors, two of which carry about 80% of the parts that are to be dip-enameled

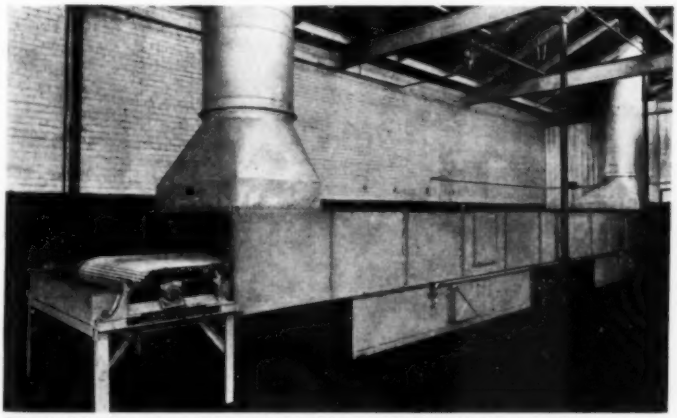

Fig. 1—The 2-stage metal-parts washing machine with long mesh conveyor.

through dip tanks — thence over drip pans and through bake ovens to the discharge end which protrudes into the assembly department.

The other conveyor carries the parts to be finished with synthetic enamel through two 10,000-c.f.m. hydro-filter spray booth units (see Fig. 2) to an unloading point where the work is transferred to a conveyor which, in turn, carries the parts through a bake oven and discharges them in the assembly department about 18-ft. from the point where the dip-enameled parts are discharged.

Heat for the dry-off and bake ovens is provided by three electrically-started automatically-controlled gas-fired indirect heaters. All automatic safety and control equipment, including recording instruments, are assembled in a neat metal panel box. One switch puts the system into operation.

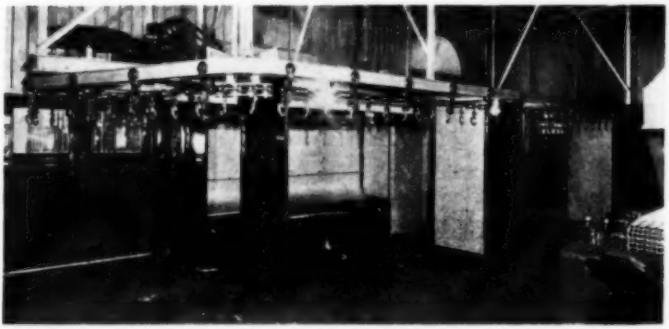

Fig. 2—Two down-draft hydro-filter spray booths are located close to the discharge end of a long mesh conveyor, part of which shows at the right.

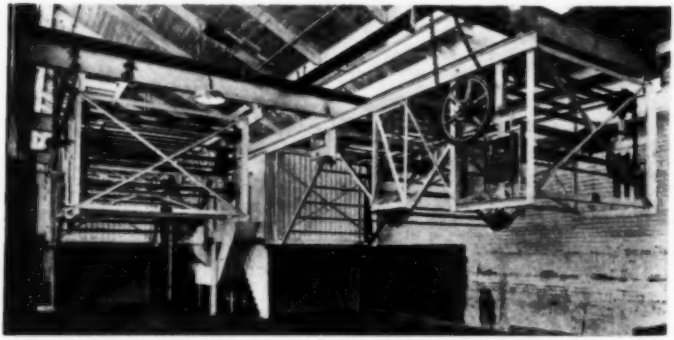

Fig. 3—Discharge end of ovens through which chain conveyors operate.

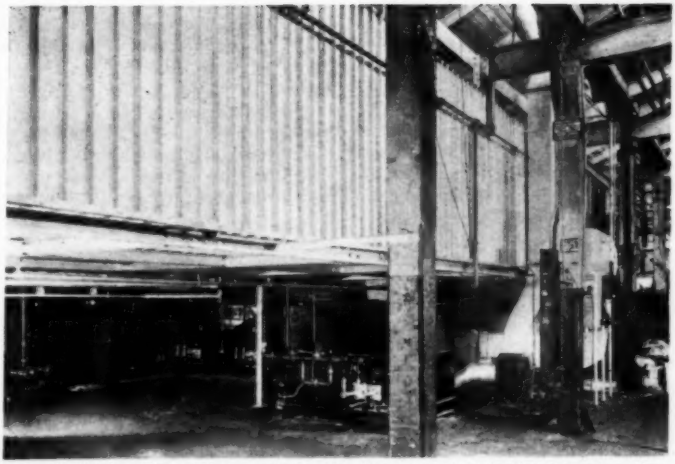

Fig. 4—Under the conveyor ovens are the new electrically-started, automatically-controlled, gas-fired indirect heaters and control panels.

This installation is an outstanding example of straight-line production methods in modern finishing; it is compact and well designed to suit the manufacturer's production plan.

Filler—The Foundation of a Good Finish

A GOOD FILLER made of properly balanced hard silex and color pigments, and also of the proper type of drying oils or mixing liquids, is absolutely necessary in order to build up a perfect finish on wood surfaces. This is especially true when lacquer is used. If the filler contains too much oil or is not allowed to dry long enough after being applied, it is impossible to get good adhesion on the filled surface with either lacquer sealer or shellac, and the result will be a poor finish, regardless of the quality of lacquer or varnish used as top coats. A lacquer film that has no adhesion on the filled surface will easily scratch off.

I have found that some of the so-called 4-hour or quick-drying fillers, if dried long enough, will give very good results as far as adhesion is concerned, because these fillers contain very little oil. Even with a quick-drying or 4-hour filler, care should be taken to dry this filler long enough in order to prevent the color in filler from appearing b l e a c h e d out, which will happen if lacquer sealer is applied too soon after filling.

This changing of color in the pores of wood is not really a bleaching action, but is caused by the small amount of a mixture of oil and naphtha liquid which is still wet enough in the pores of wood to throw the lacquer seal-

er out of solution, which in turn will form these white or gray pores. If the new quick-drying or 4-hour fillers could be made to work as easily in production and hold their color as well as the old type of long-oil fillers, then I would rather use them because of getting better adhesion with sealers on them, and therefore the finish would be better.

In regard to a tough and durable finish, I have been getting the best results with a so-called 4-hour filler which was allowed to dry overnight. The sealer held on very good, consequently the finish was hard and durable and could not be scratched off easily; therefore, I will say again, do not add oil to your fillers. Also, let them dry as long as is reasonably possible. If your sealer coat forms good adhesion on the filled surface you will eliminate a lot of finishing troubles — unless your sealer and lacquer are of very poor quality.—FERD. ROSEN.

Reclaiming Used Solvents

MANY USERS of cleaning and degreasing solvents are not only making substantial savings in solvent costs but also getting better results from their solvents with the help of a modern recovery still. It is said that this type of still returns practically any solvent that is old or dirty back to its original purity for only one or two cents a gallon, making it possible to pay for the still with savings in only a few months — even when as little as 15 gallons of solvents a month are used.

Many manufacturers claim that by taking their solvents and running them periodically through their stills they have at all times 100% efficient solvent without having to buy new supplies. Among the many solvents being recovered by this process are carbon tetrachloride, trichlorethylene, ethyl acetate, ether, alcohol, pentrchlorethylene, acetone, toluol, benzol, naphthas and others.

Solvent stills are available for either continuous or batch operation. They may be heated by steam, gas or electricity as desired. Because practically every problem in solvent recovery is different, these stills are more or less made to order of the materials best suited to the particular requirements of the plant.

Illustrated Folder Shows How to Use Spray Guns

A 6-page 8½x11-in. folder with 12 interesting illustrations and complete explanations of how to use and take care of spray guns and accessories, has been prepared for free distribution by the Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill.

The folder explains in detail the most prevalent causes of spitting and pattern distortion and tells how to correct them. It gives valuable pointers on cleaning the precision machined parts of the gun. It also shows how the oil-and-water extractor should be hooked up with the compressor to give best possible results. Large size illustrations of all important parts accompany the explanations and the salient features of both gun and extractor are further indicated in cut-away views.

One-Bake Flexible Finish

A product summary giving the properties of a cellulose type, air-drying and baking flexible lacquer enamel that withstands chromium plating, buffs without drag and requires only one bake, even when several coats are applied, is announced by the manufacturer—Roxaline Flexible Lacquer Co., Inc., Elizabeth, N. J.

PRECAUTIONS TO OBSERVE WHEN USING

Black Baking Japan

by Francis French

Notes from the experience of a practical finisher . . . . revealing some causes of unsatisfactory work in spray operation, handling of work between spray booth and oven, oven baking, etc., together with a clear explanation of the simple logical remedies for same.

In his letter accompanying the article, the author says:

"The information in this article has been acquired over a period of years in servicing and selling industrial finishes to manufacturers and enameling plants. The subject is so large that I do not begin to know all of the answers, and have only written about a few 'don'ts' of the game."

BLACK JAPAN comes in many grades and degrees of gloss, as well as for various requirements of baking and air-drying time and temperatures. Since air-drying black japans are comparatively cheap, and the processes of application and handling are not complex, I will pass this division of them by with the comment that their use is chiefly confined to the cheaper grades of articles which do not warrant much expense for finishing.

The field of black baking japans is one in which much has already been written. This contribution is intended to be more in the nature of a few notes about some of my experiences, and what not to do, rather than a treatise of advice as to methods and procedure. A great many manufacturers already have their own painting and japanning departments in operation and have worked out satisfactory methods of procedure according to their own conditions, which vary in every shop. Every baking oven presents problems to be worked out; drafts, dirt and air pressures are important factors—and, above all else, a man of experience is needed or there will be too many "rejects and do-overs." As in almost every painting operation, so it is in black japanning—a careful workman is of the greatest importance.

Temperature Troubles

In summer the temperature is usually high enough and the work to be coated is warm enough to prevent "temperature troubles" in ordinary operations. However, in cool weather, it is well to have a warm room in which to work; and it is important to bring in the parts to be coated long enough

ahead of the operation so they will become thoroughly warmed and equalized to the room temperature. Usually it is advisable to heat the japan also, either in a boiling water bath or with an electric line heater. Remember this: The spraying of warm japan onto cold surfaces will cause an immediate congealing and setting of the japan which, when it is put into the oven and warmed, softens back and often causes a bad sag before finally setting up.

One should avoid putting on an excessively heavy coating, because a high-gloss long-flow product, put on extra heavy, will nearly always cause runs from rivet heads, beads, or holes, where the japan tends to collect at a point. Corners are always difficult and at best, even with careful men and uptodate operating facilities, they may cause trouble. Another reason for heating japan is that it atomizes b e t t e r while being sprayed. It "lays on" in a smoother coat, with much better leveling. A colder japan could still be applied, it is true, but it would have to be sprayed at a higher air pressure and there w o u l d be greater danger of pebble effects or air ripples, and an ever-present tendency toward sagging.

The proper conditions are something you can't easily tell a man. He has to work them out by experience, with his own equipment. Ordinarily the viscosity of black japan, on a light liquid hydrometer, should read approximately 29° to 31° Baume at a temperature of 70°F.

Excess Moisture Causes Trouble

A common trouble and one that causes many rejects is the presence of water, either in the japan itself or in the air delivered to the spray gun. Water in the compressed air comes from condensation in the air compressor or in the air lines from the compressor to the gun, particularly if the compressor is in another room and the d e l i v e r y lines pass through an area-way or outside the building, where rapid cooling of warm air causes a fog and finally drops of water in the pipes. If not trapped out, this excess moisture in the compressed air will cause fine pinhead craters, where the water has been deposited in the film and then evaporated during the baking operation. Sometimes, in humid atmosphere, condensation will collect on the insides of a partly filled drum. In this case the japan should be heated to boiling temperature (212°F.) or slightly higher, and held there for a few minutes, whereupon the water will be evaporated.

Heating the Japan

Before leaving the subject of heating japans there is another trouble caused by the weather, but often blamed on the manufacturer, which may be remedied by heating. I mean the freezing of japans. Sometimes the material is stored in cold warehouses or shipped during cold weather and it becomes so chilled that it may show a tendency to "separate" or jell. Heating the japan that has become unsatisfactory from such cause, will nearly always restore it to its original quality. Warming the japan is very desirable where a heavy even coating with a full rich gloss must be obtained with the minimum number of coats. Unheated japan is usually too heavy to spray and

must be thinned, which cuts down the gloss and makes an extra coat necessary.

A word about methods of heating japan: Where japan is to be heated, and no electric line heaters are available, it should be accomplished in a water bath or water-jacketed container. Never heat japan (or any other finishing material) over an open fire or in the baking oven, to thin it. Spillage on the sides of the container will soften under heat, run down and thus ignite the whole supply. Several serious fires have been caused by this very practice. After being properly heated, the japan is strained into the container from which it is to be sprayed. If an electric heater is used, care must be taken to avoid overheating the japan, or leaving the "juice" turned on while one is gone to lunch or elsewhere.

Oil in the Air Lines; Oil in the Folds of Metal

Oil in the air lines will cause plenty of trouble and grief. This often manifests itself in small craters (larger than the water pock marks) wherein the japan is entirely flooded away from the metal, leaving a small ring with the metal showing through faintly, and with only a slight stain of the japan as a covering. The proper and regular cleaning of air-and-water traps or filters will keep this trouble down to a minimum.

One of the commonest causes of oil "flooding off the japan," is due to the trapping of oil under a fold of the pressed metal to be coated. To be sure, you wash this with cleaning solvent and wipe it dry, but this is not enough. Trapped oil under a fold of fabricated sheet metal or in a seam will not show up until it gets under heat; then it thins and runs out along the fold and floods off the japan, leaving an unsightly bare area. This trapped oil can be satisfactorily eliminated only by a "burn-off" operation. "Burning-off" is accomplished by putting the parts into the burn-off oven and running the heat up to 500° or 550° F. for one-half hour or slightly longer. The oven should be well vented, as dense clouds of smoke will roll out of it during the burning-off operation. Of course, it goes without saying that any work to be coated, and which must be burned off first, must have no solder present, as this high temperature would melt the solder.

Work having soldered areas can be washed with mineral spirits, or lacquer-wash thinner, or immersed in a hot alkali solution and rinsed, followed by either air-drying or heating slightly in an oven. Again a caution: Any work to be cleaned, which is made of aluminum or which contains parts of aluminum, should not be immersed in a hot lye bath as it will be completely dissolved in time. I once made the sad mistake of immersing a Packard hood in a hot lye bath to remove the paint. Returning after several hours to remove it, I failed to find it. After a long search I fished out from the bottom of the tank the iron hinge rod and the iron hood clamps. The rest was gone but never forgotten. It happened many years ago when the hoods were made of aluminum. That single experience was learned at the expense of $35, and it made a lasting impression upon me.

Only recently a small amount

of trapped oil in the tightly turned bead on the rims of the cases of some large open-air electric clocks caused sweating off, and forced the finishing department to refinish several of them. This trouble was not overcome until a small hole was drilled in the bead to make a vent which would allow the fumes to escape during the burn-off operation.

Avoid Dirt, Dust and Lint

One of the greatest troubles in black japanning is the presence of dirt imbedded in finished work. This happens in so many ways that it is practically impossible to name all of the causes, therefore only a few of them will be mentioned here; many others will probably occur to the reader. Careful inspection of the rejected work will sometimes disclose to the experienced operator where this dirt is originating. Taking it for granted that the material (japan) being used is new and not "seedy," and has been strained —if the work shows dirt, one of the first things to check is the wiping operation. This wiping is done with rags that are generally bought in lots, witn no particular selection as to quality. Some of the rags give off lint or small fibers or fine particles, and are very objectionable.

In many shops the man who does the wiping of products to be sprayed, is stationed close to the spray booth to avoid unnecessary handling and steps. This very effort to save time and space is often the cause of more grief than can be imagined, because of the loose lint and dust that is released when the parts are briskly wiped. This lint and dust is sucked along with the air into the spray booth and across the freshly sprayed work, which traps the particles like flypaper catches flies. Often this condition is unnoticed until the finished work is removed from the oven, after baking, when it is too late to remedy it. Obviously, the wiping should be done elsewhere or with a different type of rag — one that doesn't release lint or dust.

Oven Operation

Dirt in the finish may also come from an accumulation on the ceiling and walls of the baking oven. Even a dirty floor in front of the spray booth will cause grief, for as the spray man moves about, enough dirt is raised to cause plenty of headaches. A sweeping and a "hosing" or mopping down operation is in order daily for best results. Also, in passing, I might mention that it is often the operator with the dirtiest overalls who has the least trouble with dirt and lint. However, this is not a plea for paint-stiffened overalls.

Opening and closing oven doors rapidly is another objectionable practice, because a suction or compression occurs which causes the still air in the oven to be violently stirred up. It picks up dust particles and deposits them on the wet japanned surfaces. In ovens that are so constructed as to have open-flame burners, this violent shutting of the doors may "blow out the gas" and cause still more grief.

Many spray men who have ovens close to their spray booths spray a coat of black japan over the inside of the oven to seal in the dirt and dust. This is only a temporary remedy as eventually the japan, under repeated bak-

ings, will lose its life and elasticity and flake and peel off or disintegrate and drop off in small particles. Falling on the floor, it is further ground up by traffic in and out and the dirt condition again reappears. A better method is to occasionally wipe down the walls and ceiling with a linseed-oil-soaked rag wrung out nearly dry. This oil, being elastic and very heat-resisting, forms a more enduring film and stands continued heating and baking longer and will keep the dirt hazard down to a minimum.

Recording Thermometer Needed

Once the work is hung or run into the oven, the doors should remain closed until the japan has set and is out of dust. It should never be necessary to open a door to look at the work. The oven should have a thermometer that shows through a glass window, or one mounted outside the door; or better yet, a recording thermometer on the control board. This recording thermometer shows the foreman exactly what has been done, and when. It is a definite check against careless work. Also, it reveals a definite record of what the night crew, if one is operating, has done and the number of times the oven doors have been opened. In case of a fire, this continuous record is very valuable evidence as to the time and conditions of the occurrence.

Racking and Hanging Products to Enter Oven

Hanging and loading the work into the oven are very important parts of the operation, especially where it is essential to obtain clean work. In hanging up any work, the hooks should be so arranged that the finished side of the work is down, to prevent dust settling onto the wet surface. If this is impossible the work should be hung vertically. It is only when a flat piece is heavily loaded with japan and there is danger of runs, that it may be permissable to hang it or lay it face side up and in level position.

In loading work onto trucks to be pushed into the baking oven, the racks should be loaded from the top down, so as to protect the finished work from any particles that may be jarred loose and drop onto the fresh work. This is not always possible but is usually desirable. Also, the racks should be made of steel. Wood, while it will endure fairly well for some time, eventually chars and powders and is worse than lint.

In the foregoing article I have written always with the idea of spraying the black japan. I have not discussed the troubles and worries involved in dipping methods, except as dirt, etc., applies to both. Also, I have mentioned nothing about undercoaters or the condition of the metal surfaces to be sprayed.

Before closing this discourse I should say that metal that is rusty or metal that shows mill scale or cracks will not finish up smoothly. Really, when metal surfaces are in this condition they should be cleaned by approved metal-cleaning methods.

Lacquer for Blanking and Forming

A product summary giving the properties of a clear, cellulose type, air-drying flexible lacquer for blanking, forming, printing or lithographing without chipping', flaking or peeling, has been released by the manufacturer—Roxalin Flexible Lacquer Co., Inc., Elizabeth, N. J.

CHEMICAL ENGINEER SUMMARIZES A TEN-YEAR EXPERIENCE IN

Painting Storage Battery Containers—II

by Alvin Fuhrmann
Chemical Engineer
National Battery Co.
American Container Div.

This part II of Mr. Fuhrmann's article takes up in some detail certain characteristics of both cellulose-base and synthetic-base materials used in the painting of new storage battery containers.

UNDER the group classification of Vehicles, I will first consider:

1) **Cellulosic-Base Materials** — There are several members of this group which are outlined as follows:

A. Nitrocellulose-Base Lacquers This product was being widely used in 1927 for a great number of industrial applications, replacing to a great extent the long-drying oil-type varnishes previously considered essential. Finishing costs and equipment investments were being reduced. However, it soon became evident that no one class of material could be expected to meet all industrial service requirements. Such was the case with storage battery containers.

Principal objection in lacquer application was a pronounced tendency to film "blushing." This occurred during the drying period when the lacquer film would assume a grayish, opaque appearance due to partial precipitation of the solid content. The cure depended upon sufficient increase in room temperature to reduce humidity and the use of solvents which possessed a vapor pressure lower than water. The former was often impractical, particularly in winter months, and the latter course meant increased solvent costs.

In addition to this, the dry film adhesion was poor on both molded asphalt composition and hard rubber, but most important was the difficulty of obtaining pigmented materials with sufficient resistance to sulfuric acid.

B. Cellulose Acetate—This material has been widely adapted as a plastic but has not been found suitable as a container finish due to lack of acid resistance.

C. Cellulose Ethers — Leading members of this group are benzyl-cellulose and ethyl-cellulose. Materials tested were found to lack

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adhesion, gloss and acid resistance. Cellulose ethers are new developments and, due to high production costs, have not yet been generally adopted in this country.

In the field of industrial finishes and in our further description, the term "lacquer" refers to a nitrocellulose vehicle base, whereas the term "synthetic" refers to a non-cellulosic base.

2) **Synthetic-Base Materials** — As an indication of the rapid growth in this field, it should be realized that since 1930 the volume of business in synthetic finishes has practically doubled each year. Lacquers are still used and will continue to meet many specific requirements, but the large industrial territory has been rapidly penetrated by synthetic finishes. This rapid increase led to the development of many types of resins, and today research is increasingly active, with the result that the problem soon became one of "What type synthetic."

As a class, synthetics contain a solid content varying from 20% to 40%—double that of lacquer—which decidedly improved covering power and reduced unit costs.

Usually, the best characteristics of a synthetic material can only be obtained by using a bake finish. This meant a baking temperature ranging from 175° to 300° F., which resulted in serious distortion and loss of surface appearance on a molded asphalt composition or hard-rubber container. Selection, therefore, was limited to air-dry materials. However, this air-dry period can be forced by the use of hot air blasts at about 125°F. for short intervals. In the case of 3-coat jobs involving a pigmented base coat, a veil or crackle second coat and a clear varnish protective coat, oven drying was used after each application in order to speed up production.

Conclusions concerning the various types of synthetic vehicles tested are as follows:

A. Ester Gums—Reaction product of rosin and glycerine. The first widely used synthetic but not a durable material.

B. Alkyd Resins — Usually a combination of a polyhydric alcohol with a poly-basic acid or its anhydride, as for example, glycerine and phthalic anhydride. Modified alkyd resins providing increased flexibility are obtained by using a monobasic fatty acid such as tung oil with the poly-basic acid. Materials prepared on this base are extremely tough and durable but lack moisture and acid resistance.

C. Indene Resin — Polymerization product of indene and cumaron or their coal tar homologs. Commonly termed paracumaron resin. This material provides only a fair degree of acid resistance and lacks adhesion.

D. Chlorinated Rubber — First developed on a production scale as a base for finishing material in Germany under the trade name of "Tornesit." Chemistry of the process involves chlorination of the rubber isoprene group. Characterized as a resin by excellent acid resistance, but when formulated as a finishing material with necessary plasticizers, acid resistance is sacrificed. Adhesion has never been found satisfactory and application is difficult. However, this is one of the most promising of recent synthetics, and with continued formulation experience a satisfactory finish should soon be available. *(Continued on page 39)*

E. Pliolite Resin — Formed by the reaction of chlorastannic acid with crude rubber under controlled milling conditions. Observations to date are similar to those made on chlorinated-rubber-base finishes. This material is also a new development and with continued research it is only reasonable to expect further improvement in adhesion and application, which at the present time are the limiting factors for container application of this product.

F. Vinylite Resin—Formed by the polymerization of vinyl chloride and vinyl acetate. Vinyloid finishes are outstanding in acid resistance, but only when baked at a temperature of 275°F., a requirement necessary for proper adhesion.

G. Styrol Resin — Produced by the polymerization of ethyl-benzene. A new material not thoroughly developed in this country. Present high cost of production has been a limiting factor. As a plastic, this resin has excellent dielectric properties and resistance to acids.

H. Phenol-Aldehyde Resins — The reaction product of an aldehyde and a phenolic body. The first widely used synthetic and the leader in volume produced. This material has been extensively adopted in the fields of plastic molding and industrial finishes.

Research has resulted in the development of numerous modified forms designed for specific uses. Of all materials tested, a modified tung oil, phenol-aldehyde base varnish has provided the best combination of all factors as a container finishing material. Films of this type have excellent water repellant properties with good acid resistance and, when prepared with proper plasticizers, their adhesion, application and gloss characteristics are excellent.

This concludes the observations in regard to vehicles. However, the value of a good base is lost unless proper acid-resistant pigments are used in the formulation of any colored finishing material prepared for container application. Efforts were next made to procure suitable chemical colors in combination with the approved phenol-aldehyde vehicle.

The last installment of this article, to appear next month, will take up pigments and solvents of finishing materials for painting storage battery containers; also equipment and methods of application . . . . and the author's final conclusions.

Shirt Shows Skeleton

If your director of safety gives workmen instructions about first aid and care of the body he will be interested in the "anatomical shirt" on which is indelibly printed life size cross sectional views of bones, organs, arteries, veins, etc., in the body and arms. It makes a striking appearance when worn by a demonstrating subject . . . . a product of Mine Safety Appliances Co., Braddock, Thomas and Meade Streets, Pittsburgh, Pa.

Hose & Rubber Co. Opens New Office

The Electric Hose & Rubber Co., Wilmington, Del., announces the opening of a new and larger Eastern Sales Office at Room 919 Nine Rockefeller Plaza, New York, N. Y.

The new office, occupying more than 600-sq.ft. of floor space, will serve as headquarters for Mr. A. B. Dougall, General Sales Manager of the company, and Mr. D. C. Smalley, Manager of Metropolitan Sales Division.

All sales correspondence, orders and inquiries of Eastern origin should be directed to this new address.

HOW A SERVICE MAN'S SUGGESTIONS

Wiped Out Six Troubles

by T. R. Nall

GUESS WORK is expensive in the finishing room—and this is why it pays to have a service man inspect and check up the average finishing department four or five times a year. An experienced service man can help the department foreman reduce his costs and speed up production. Many times he can help the department turn out a much improved product.

I was called upon to service a finishing department that manufactures showcases, vegetable bins and meat refrigerator cases, all of which are manufactured of metal. These cases were finished in synthetic baking enamel—green, white, gray and tan.

Here is a plant that was going along, paying a heavy penalty for such troubles as orange peeling, variations in thickness and gloss of coatings, wasted materials due to excessively high air pressure, sandpaper scratches in primer coat, and lost time plus inefficiency in the use of a large gas-fired oven. A service man called, straightened them out and effected tremendous savings in their product finishing.

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Guessed at Viscosity and Got Three Kinds of Trouble

One of the first things that came to my attention was the fact that they were reducing all of their enamels by guess work; no accuracy. The results this company were getting from their guess work included: 1) bad orange peel, 2) coatings too heavy on some areas and not heavy enough on others, 3) gloss of enamel too high in some places and insufficient in others.

Suppose you were buying enamels from a reliable company and were told that in order to get the best results you must reduce this enamel just enough to show a certain viscosity when tested with a No. 4 Ford cup. Wouldn't you do it? If it were not important to follow directions, the paint companies would not go to the expense and trouble of having laboratories work out all details in order to make their materials produce the best results before they are put on the market. Sometimes it takes years in the laboratories to perfect certain materials.

Another important point is that enamels should be kept at a cer-

Four centuries ago . . . to please the whim of Francis I of France . . . Benvenuto Cellini fashioned in purest gold, a magnificent salt cellar. To this day it remains the finest example of the art of goldsmithing . . . a perfect specimen of beauty that endures.

But the famous Florentine would be astounded to see how present-day manufacturers of the most prosaic products seek these same qualities—beauty and durability—formerly reserved for the arts. For example take the manufacturers of metal articles. They know the sales value of an attractive finish that can "take it" . . . they demand tough, beautiful A & W "Tailor-Made" Finishes.

Poor lacquers or enamels mean more rejects . . . jam up your production line . . . eat into your profits. Take no more chances. Call in the A & W representative and have him develop for you an A & W Finish that is specifically designed—"Tailor-Made" —for your needs.

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tain temperature while they are being sprayed during production.

Excessive Air Pressure Wasted Material and Time

The second thing that I noticed was that they were using compressed air at a pressure of 125-lbs. on the spray line. This was causing a dry spray, orange peel and a heavy waste of finishing material. I cut the air pressure to 85-lbs.; the enamel sprayed on wet and flowed out beautifully. This effected a 50% saving of enamel and spray time. In using compressed air at a pressure of 125-lbs., the spraying had to be done over two or three times. When the air pressure was cut to 85-lbs. pressure, one spraying was sufficient.

Too Coarse Sandpaper Produced Scratches in Finish

The third thing: They were using very coarse sandpaper to sand the primer coat. They used this sandpaper up and down and crosswise and around and around —part of the time with a circular motion. When the finished coat had been sprayed on and baked, you could see sandpaper marks. In fact the finished coat magnified all of the scratches. I overcame this condition by using No. 320-A or No. 280-A sandpaper (wet or dry) and always sanding one way. On a long panel it is usually best to sand lengthwise, not crosswise. In sanding lengthwise the scratches do not show up to the eye. Some people seem to think that if they use a coarse sandpaper it speeds up production. This is not true. However, coarse sandpaper has its purpose, but not in this case. Some coarse sandpapers clog up rapidly and cause deep scratches, whereas the finer abrasive paper cuts faster and makes a dust instead of clogging the paper.

Two Baked Finishes Caused Oven Congestion

The fourth thing: The oven was 100-ft. long by 12-ft. wide. I noticed that when show cases came out of this oven they were allowed to cool off, and a space above the bottom was masked so they could spray a black band about 6-in. wide around the base of the cases. After this operation they would return these cases to the oven again to bake this black base band.

One oven is all they had, and when they were rushed they had to wait for this small operation before they could put any more cases in the oven. This was expensive and held up production. One can imagine the cost of using this large gas-fired oven to bake the black band around those bases. I asked them why they didn't use an air-drying black enamel for those bands. They told me no one had been able to work out a satisfactory air-drying material for this work. However, the company I represented was able to supply a suitable air-drying material for them, and they are still using it today. So you can see a tremendous oven expense was cut down and production was speeded up 50%.

Metal Cleaning Booklet Free

A new booklet of 12 illustrated pages 8½x11-in. on the very interesting subject of production cleaning metal parts by solvent degreasing equipment has just been issued by G. S. Blakeslee & Co., Cicero Sta., Chicago, Ill. Information is given about the degreasing process.

DUM DUM

IT SEALS . . . IT STICKS . . . IT SILENCES

Here are a few of the many uses to which industry has put DUM DUM

- Silencing metal sinks
- Sealing linoleum desk tops
- Cementing pads in ventilating fans
- Sealing edges of Safety Glass
- Sealing refrigerators
- Sealing felt pads on phones and office equipment
- Erecting wall board
- Cementing sound-deadening pads on streamlined trains
- Glazing Clipper Planes

Will *your* problem—(of calking, sealing, glazing, deadening or cementing)—be the next to be solved by DUM DUM? Write us your requirements. Our laboratory will be glad to help.

THE ARCO COMPANY

CLEVELAND • LOS ANGELES

LACQUERS • ENAMELS • SYNTHETICS

Sole Bottom Lacquer

A new lacquer for finishing the bottoms of shoe soles which, it is claimed, reduces costs and speeds up production, is being placed on the market by Maas & Waldstein Co., makers of industrial finishes. Newark, N. J.

This new lacquer takes the place of water paint and eliminates the need for buffing the soles prior to application, as it covers rough surfaces with a smooth, durable coating. According to the manufacturer, a finisher can finish from 60 to 75 cases a day with this lacquer, at a cost of about 8 cents a case.

The M & W sole finishing lacquer is supplied in clear and in black, and in dull, medium, and high gloss. It is applied by spraying and dries rapidly in the air. One gallon, it is said, will cover more than 1,000 pairs of shoes.

Rotary Spray Machine

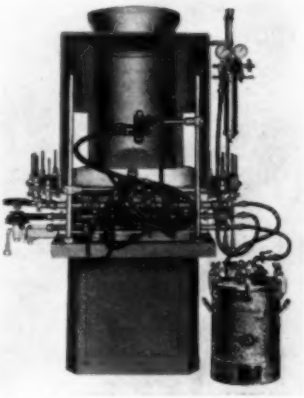
High speed automatic finishing of small and medium size articles can be effectively accomplished with a new improved rotary spray-finishing machine, Type YB, recently announced by the DeVilbiss Co., Toledo, Ohio. This machine is capable of an approximate production up to and exceeding 3,600 finished, small, light weight articles per hour.

The machine is equipped with spindles, automatic spray gun, automatic control valve, hose connections and other complete accessories of the modern spray-finishing unit. It is available in three sizes for light, medium and heavy duty service.

All sizes are equipped with improved speed reduction unit, and may be operated at several different speeds to fit the requirements of the operation. If desired the machine can be provided with a cam so that the spray gun operates at every second spindle when the machine is used for finishing larger articles.

The turntable is driven by a ¼-hp. electric motor, the speed of which is determined by the work to be done. Turntable will accommodate 15, 20, 25, 30, 40 and 50 spindles, number of which is dependent on the size of the pieces to be sprayed.

The exhaust chamber can be specially designed to meet individual requirements. The machine may be equipped with a drying oven if desired.



Does the spray work automatically.

A few of the features claimed to make this new machine a real contributor to efficient and economical spray-finishing are:

1) Control of spraying period by adjustable cam; results in saving of material.

2) Speed limitations of machine governed only by ability of operator to load and unload pieces to be sprayed.

What's New . . .

HILO BLACKS IN ACCOUNTING

Fifty years ago, when bookkeeping was done laboriously by hand, the accountant's only tool was a steel pen set in a wooden pen holder—the latter, more likely than not, finished in Hilo Black Baking Japan.

Bookkeeping and adding machines have replaced the steel pen and wooden pen holder; and Hilo has kept pace with the times, for Hilo Blacks protect and beautify many of these modern accounting tools. Hilo Black Rip-pl or Crystal, used with the japan, often add novelty and sparkle to the finish.

Mail the coupon for a free sample of Hilo Black Baking Japan and a copy of the descriptive bulletin, "Black Enamels and Japans."

HILO VARNISH CORP.

42-60 Stewart Ave. Brooklyn, N. Y.

BOSTON CHICAGO

HILO

HILO VARNISH CORPORATION,
42-60 Stewart Ave., Brooklyn N. Y.

Gentlemen: We'd like a copy of the revised bulletin "Black Enamels and Japans" and a free sample (type checked).

Gloss	for use on Wood	Air Dry
Eggshell	Steel	Baking
Dull	Cast Iron	250° F.
Rip-pl	Brass	350° F.
Crystal	Aluminum	

Company.....

By.....Title.....

Address.....

City.....State.....

3) Auxiliary drive shafts integral part of reduction unit.

4) All shafts rotate on roller bearings in continuous oil bath.

5) All gears and bearings in one substantial cast iron housing.

6) Rotating tables up to 60-in. in diameter available.

7) "X" Type frame for speed reducer mount.

8) Seal to prevent finishing material from entering ball bearing spindles to top.

9) Simplified header system to accommodate four guns.

10) Spindles rotate by belt with automatic take up device driven by V-belt from speed reduction drive shaft.

11) Long bearing surface spindles which rotate on ball bearings.

Temporary Covering for Finished Surfaces

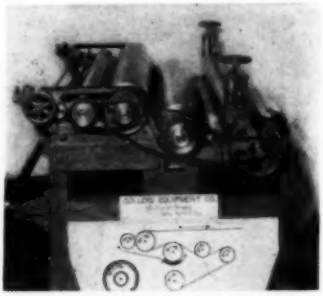
Protex is a non-inflammable material sold in concentrated form and can be thinned with distilled water to a consistency suitable for brushing, spraying or dipping like paint. Its purpose is to provide a temporary coating—a thin tough elastic film—for protecting highly finished surfaces throughout manufacture, storage and shipment. It prevents the scratching of stainless steel, aluminum, plated and lithographed metals.

To remove the film of Protex, one merely breaks it and peels it off; it comes away quickly in one piece without leaving residue in cavities or corners. The protected surface is left clean and clear with its original luster and color. Protex is available in several types for brightly polished metal, and for enameled, lacquered and varnished surfaces.

The freshly applied coating of Protex must be dusted with soapstone, powdered mica, whiting or talc, or covered with paper to make it easy and convenient to handle. Craft paper can be immediately spread over the freshly Protexed surface in the same way as wallpaper is put on. The material is a product of Haydn F. White & Co., 1740 E. 12th St., Cleveland, Ohio.

Coating Machine

The coating machine illustrated here is called the "Meadows Roller Coater," and is evidently designed to coat a continuous sheet of flexible material which can be unrolled from a roller and passed in a continuous line through the rollers, as shown in the accompanying diagram. Accord-



The diagram shows how a continuous sheet unwinds from a roll and is coated as it passes through the machine.

ing to information supplied by the Colloid Equipment Co., 50 Church St., New York, N. Y., accurate, smooth, high speed coating of lacquers, rubber solutions, metallic coatings, and lacquer emulsions can be made on this roller coater.

The machine is sturdy and compact and has a wide range of adjustment which allows the application of diversified materials in many weights of coating. The use of a separate furnisher roll insures the application of a smooth, continuous coat, without wasteful non-coated margins; while the fact that the metering rolls are used only to control the weight of coating makes for extremely accurate control.

Quick Turn-over

QUICK TURNOVER is important in all lines of business ... And in most cases quick turnover is dependent on eye-appeal. In these days of display competition, eye-appeal is of paramount importance. No matter how well made or what utility value your product may have, you are just out of step with competition if your finish is not up to par.

EGYPTIAN Finishes, including Lacquers, Lacquer Enamels, N-F-R (Synthetic) Varnishes and other industrial coatings, have been used to give products eye-appeal for over fifty years. During this time EGYPTIAN has specialized in industrial finishes of all types and has naturally gained a wealth of experience ... experience which is at your command to aid you with your finishing problems.

Call on us when you are in the market for finishes of any type. The chances are that one of our hundreds of standards will answer your requirements but if not we will be glad to formulate individual materials for your specific needs.

THE EGYPTIAN LACQUER MFG. CO.

LACQUERS · SYNTHETICS · PAINTS · VARNISHES

ROCKEFELLER CENTER NEW YORK, N.Y.

Machine widths range from 40 to 70-in.; speeds, 25 to 75 yards per minute. Circulating pump and automatic leveling control of coating material in reservoir, can be supplied. Also, the machine can be furnished with or without a knife coating attachment.

External Atomizing Spray Gun

Finishing room superintendents will be interested in a new type of commercial spray gun just announced which is said to effect a considerable saving in air in the application of lacquers, enamels and other fast-drying materials.

With this external atomizing gun, made by Saylor-Beall Mfg. Co., Detroit, Mich., the paint materials leave the nozzle orifice enveloped in a tube of air, as in the ordinary spray gun. Then, instead of being played upon by a number of air streams from several side ports, it receives two blasts that are softened as they slide off baffle planes spreading the pattern. Only these two auxiliary air streams are required to complete atomization and produce the ideal oblong pattern. On this account the manufacturer claims a better coverage, in shorter time, and at a considerable saving in air.

Spray gun with cup attached.

The spray gun is of the shut-off type for use with air storage tank. Five sizes of nozzles are available. The Saylor-Beall line includes other gun models for use with stationary and portable outfits, regulators, filters, valves, fittings, portable and stationary compressors, etc.

Pigment for Baked Lacquers

A new titanim dioxide pigment for baked lacquers, which will withstand higher temperatures without yellowing, has just been announced by the Krebs Pigment & Color Corp., a subsidiary of E. I. du Pont de Nemours & Co. The use of this pigment permits a reduction in the time required for baking finishes, according to the company's announcement.

The new pigment, known as "Ti-Pure Cr," will resist discoloration in baked finishes, and show reduced yellowing in air-dried coatings on exposure to light.

The grades of titanium dioxide heretofore available have required the addition of auxiliary pigments, such as zinc oxide, in many formulas to achieve satisfactory resistance to yellowing. This pigment, the company says, has sufficient color stability of its own that supplementary pigments are not required. This simplifies formulation problems, particularly where highly reactive vehicles are used which are frequently incompatible with some pigments normally used to prevent yellowing.

The pigment shows most resistance to discoloration in alkyd resin vehicles, slightly less color retention in nitrocellulose lacquers and least resistance in phenolic and maleic anhydride type resins. Its color retention is superior to that of the

The Beginning of the Finish

Whether it's people or products, finish is an important factor in meeting the public because first impressions are usually lasting impressions. Carefully groomed people are automatically classified as successful . . . well finished products are automatically classified as quality merchandise.

That you may capitalize to the utmost on first impressions so far as your products are concerned, we invite you to use the facilities of our creative studio. Let us analyze the finish of your products and submit our ideas for consideration. There is no charge to reputable concerns for this service.

No Tampering with Quality

ROCKFORD VARNISH CO., ROCKFORD, ILL.

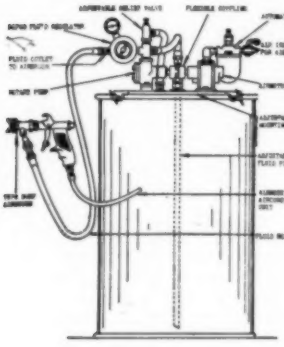
regular grades of titanium dioxide in both air-dried and baked coatings, and it is equal, if not superior to, the regular grades in rate of drying and retention of drying in 4-hour and 16-hour enamels. It also develops less discoloration in plastics.

The pigment is sold in two grades, one of medium oil absorption, the other of low oil absorption.

Portable Fluid Pump

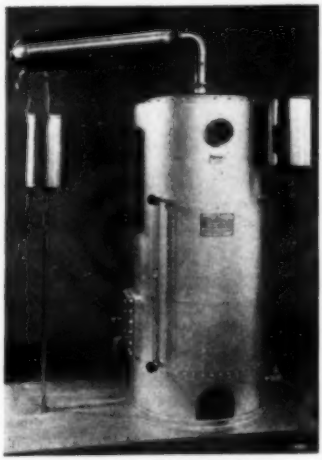
A portable fluid pump that can be mounted on the head of a material container and set into operation to draw material from the container and supply it to a spray gun, is one of the new products of Paasche Airbrush Co., 1909 Diversey Parkway, Chicago, Ill.

It consists of a motor, either air or electric driven, fluid pump with collapsible fluid pipe, adjustable relief valve, regulator and gauge, and adjustable mounting plate; is easily interchangeable and quickly transferable from one material container to another. Pressure, which is controlled by the fluid regulator, is built up by the pump to the airbrush and not in the container. From 1 to 60-lbs. pressure can be maintained continuously by this method.



Cleans Used Solvents

Used solvents that have become dirty and mixed with other materials in the process of cleaning or degreasing metals, etc., can be restored to their original purity and usefulness by putting them through a recovery still. The cost of salvaging many used solvents is only one or two cents a gallon, according to the manufacturer of the recovery still illustrated here.



Reclaims used cleaning solvents.

Such solvents and cleaning fluids as carbon tetrachloride, trichlorethylene, ethyl acetate, ether, alcohol, pentrchlorethylene, acetone, toluol, benzol and naphthas are being regularly recovered by this process.

The stills are available for either continuous or batch operation. They may be heated by gas, steam or electricity. The manufacturer of the recovery still shown here is the Barnstead Still & Sterilizer Co., 140 Lanesville Terrace, Forest Hills, Mass.

MAEHLER OVENS

for all baking applications

The PAUL MAEHLER Co.

2218 W. LAKE ST. — CHICAGO

SILK SCREEN METHODS of REPRODUCTION

THIS new book is intended for Sign Painters, Card Writers, Display Men, Furniture Manufacturers, Novelty Manufacturers, Glass Etchers and For Domestic Use.

Every detail of the silk screen process is presented clearly in detail. All equipment is fully described and its use illustrated. All materials needed in the various kinds of silk screen work are mentioned with respect to their use to advantage. Estimates of costs and prices to charge are given.

Fully Illustrated by the Author. Leatherette Binding. Size 5x7½ in. 193 Pages. 98 Illus...... $3.00

Practical Publications, Inc.

222 East Ohio Street Indianapolis, Ind.

Questions Answers

To Clean Hooks Caked with Finish

We have been using lye for cleaning bed hooks on our finishing conveyor. These hooks are covered with a mixture of stain, lacquer sealer and varnish, which hardens as the hooks pass through the drykiln. The lye solution is not strong enough to entirely remove this material from the hooks. We have found that burning the hooks is not satisfactory as this damages them. Can you suggest a solution that will be economical and will thoroughly clean the hooks without damaging them?—M. Furn. Co.

There are a number of commercial paint and varnish removers and "strippers" on the market. Some concerns use various other solutions for stripping accumulations of finishing material that have dried hard through repeated force-drying or baking in ovens. For example, commercial metal-cleaning compounds are often used boiling hot to strip off hardened enamel. One finisher who has a considerable volume of this stripping to do uses a 50/50 mixture of O——— (metal-cleaning compound) and lye stirred into a suitable quantity of water in a tank and heated to the boiling point. He submerges hooks, baskets or any other coated metal into this hot solution for whatever length of time is required to thoroughly soften and loosen the caked-on coatings — possibly one hour or two hours. Then he removes the hooks, rinses them in hot water and brushes them with a stiff wire brush.

Another finisher reports the use of a strong solution of potash which he keeps boiling hot, and then rinses the work in plain hot water afterwards.—D. F. R.

Send in your problems and questions. Every finishing department has them. Well informed men are eager to help you—through Industrial Finishing. Also, if you have any more comments, or suggestions to add to the replies published here, please send them in. An exchange of ideas helps all of us.

Finishing Brass

Can you tell us of a good method of finishing brass? We have been using the acid-dipping process, and we would like to find either an improvement on our method of dipping in acid or to learn of some method of applying a finish which resembles brass.

Our production is so small that we cannot afford an expensive outfit, but we would like to have you give us a dipping formula, or refer us to someone who can tell us what we want to know.—M. U. R. Co. (Signal Equipment).

Your letter does not give much information in regard to a finish; it does not say whether you intend to lacquer the finished articles or not. But first of all, acid dipping—that is the ordinary bright dip—is not a finish, but just a means of cleaning brass before soldering or finishing.

A good finish can be made at

SURFACERS

PORES NEED FILLING for smooth - textured attractive finishes. Presdwood, celotex, natural woods, rough metals and porous compositions need quick-drying, easy-sanding, high-bodied surfacers—in short, our CEL-U-LAK Surfacers.

These have unusually high body, coupled with low viscosity, permitting a heavy application by spray; air dry to sand in 1½ hours, force dry at 125° for 20 minutes. They are ground finely and have phenomenal adhesion and resistance to moisture.

CEL-U-LAK Surfacers are standard in white, ivory, dark grey and red. They have for 6 years been an outstanding successful item in our line. We suggest you examine it for your requirements.

The
VARNISH PRODUCTS CO.
CLEVELAND, OHIO

FOR PERFECT MASKING JOBS IN QUICKER TIME USE . . . . .

PERMACEL
THE PAPER MASKING TAPE

JONFLEX
FINE CLOTH MASKING TAPE

INDUSTRIAL
COARSE CLOTH MASKING TAPE

SAMPLES ON REQUEST
SIZES ¼" TO 36" WIDE
IN 60-YD. ROLLS

THE REVOLITE CORP.
REG. U.S. PAT. OFF.
NEW BRUNSWICK, NEW JERSEY

low cost by the following method: After bright dipping, finish the articles on a 10-in. padded buffing wheel (speed 1800-r.p.m.) with Lea's compound, grade N. This is a dry compound and can be lacquered right after finishing. No washing or cleaning is required before lacquering. This finish is called brushed or satin finish.—AUGUST L. MEDEL.

There are a number of ways to finish brass, but I am going to give you two of the cheapest ways of doing it. For the Editor's inspection, I am enclosing a small sample of brass finished with Lea's compound.

Take the brass article from the press and wash it in high-test gasoline (68 to 70 test) and let dry. This must be done to remove any oil or grease from the surface. Of course, if you have a degreaser, use it; or, if you have a coloring room, use the electric cleaner, and dry in sawdust. After the cleaning operation, the work is ready to finish.

The sample of brass is washed, but not bright dipped. Next, use a polishing lathe running about 2800-r.p.m. The faster it runs the quicker it does its work, but it produces a brighter finish. Take cloth buff about 1½-in. wide and put some Lea's compound (grade G) on the wheel; let dry for half a minute before starting to "satin-finish" the work. Referring to an imaginary plan view of the sheet to be polished, start at the upper left-hand corner and run across to the upper right hand corner. Run back and forth, contact left to right and right to left, until the work is completely finished (to the lower edge of your imaginary plan view). Lay the finished satin work on screen or on trays so the sheets won't get scratched before lacquering.

Before lacquering, use a special wiping cloth or a piece of flannel cloth and wipe with the grain of the satin effect, not across.

The method of lacquering will depend on what the article is. Probably you can spray it four ways on the screen resting on turntable. (That is, from front to back, from each of the four edges).

Another method is to use a steel satin-finish wheel instead of the cloth buffing wheel and polishing compound. I sometimes have to do this and use the wheel on a lathe running about 3600-r.p.m. This produces a much deader finish.

If the finished brass shows any reddish streaks, I suggest that you complain to the firm from whom you buy your brass. We are getting brass that we do not bright dip, and sometimes a batch of brass comes in that shows a trace of copper color in the finish, but this is very rare. If you will send me a sample, I will be glad to finish same and will tell you just what I did to get the finish. —L. E. DEXTER.

The best and cheapest finish for articles made from all brass (without soldered parts) is a bright acid-dip, followed by a clear lacquer coating. I can't quite understand why you want "a finish that resembles brass," when you are starting with real brass. All the acid-dip process does is to brighten and matt the surface. You can't imitate brass better than the genuine metal itself. An electro-plating of brass won't do any more than put a

SPRUANCE QUALITY

LEADERS

IN WOOD FINISHING MATERIALS SINCE 1907

SPRUANCE QUALITY

NOW LEADING AGAIN WITH

53-764 Mahogany 57-763 Walnut

ACID STAIN POWDERS

Beautiful New Tones that will be exhibited at the coming

FURNITURE SHOW

Write the makers for information and samples.

THE GILBERT SPRUANCE COMPANY

RICHMOND & TIOGA STREETS PHILADELPHIA, PA.

Those small items . . . . finishing now simplified

Use The "Speedip"

WHIRL ENAMELER

There's a decided advantage when enameling and lacquering small parts in the "Speedip" . . . it saves time, labor, material, and puts on a much improved finish. Do not let costs of finishing small items mount higher and higher, and mean a problem to you. Mail us some of your small items TODAY . . . we will finish them in the "Speedip" Whirl Enameler and return for your inspection, together with estimated costs of doing the work. Don't miss this demonstration. No obligation!

RONCI MACHINE COMPANY

45 River Avenue Providence, R. I.

coating of brass (about .0003-in. thick) on top of the brass you already have.

Perhaps you are referring to the degree of finish, for instance matt, scratched, buffed, sand-blasted, tumbled, polished, etc., and not to the final color.

I suggest you send me a sample of your work before and after it is acid-dipped; and also a sample to show the finish you want. Then I will be in a much better position to answer your question intelligently.

Possibly you are trying to save money or meet competition (two very good things to do); if so, I know you can save plenty if you will use cold-rolled strip steel instead of brass. Today's prices for medium gauges in lots of 500-lbs. are:

Cold-rolled strip steel	(per lb.) 07c
High Brass	(per lb.) 20c
Rich Low Brass	(per lb.) 23c

There may be a good reason why you can't use steel, but let's have it before we agree.

To show some results obtained by large and small concerns I am sending to the Editor, under separate cover, three different samples. Lot No. 2 and No. 3 are from steel. Lot No. 1 is a special alloy of brass, and imitates gold; no plating. This may be the color you are trying to get on regular high brass, which is impossible except by electroplating.

Since I can help to save you m o n e y — and if I do—I would want a small fee for a detailed report, finishing samples of your work, furnishing details of the processes, formulas, cost figures, production data, etc., or any other information you may specifically request.

There are many formulas for bright acid-dips, but on account of the many variables such as base metal, finish wanted, color, etc., I would not recommend one offhand. The chemical parts, however, are generally oil of vitriol 66°, muriatic acid, nitric acid, and water. The proportions, duration of immersion, processes, etc., are entirely dependent upon some of the variables mentioned above.—CHAS. W. HARDY, Industrial Consultant.

Antique Bronze Craft

In answer to the A. A. Co., who ask about how to produce a combination cast and etched design on a bronze sash lock (see Oct. issue, page 13) I suggest the following:

First, remove the sand and grease from the casting. Parts to be etched should then be covered with melted bee's wax. Wax acts as the acid resistant. If a large area is to be etched it is well to dip the whole casting in hot wax. This gives a more even coating.

When the wax has cooled, trace the desired design into the wax with a sharp instrument, such as a layout scribe. Be sure to press firmly enough to penetrate the wax and scratch the bronze surface lightly. Apply nitric acid to the scribed design by pouring on or by dipping the entire wax covered casting into an acid bath. Inspect at intervals to determine the depth to which the acid has attacked the metal. The depth can be determined with a wax-covered scribe point.

When the required depth has been attained, rinse the casting in water to kill the acid. The wax can be removed with boiling water

"MEET ME AT SPACE 544 D GLIDDEN HAS SOMETHING UNUSUAL THERE!"

Don't delay—they're showing some NEW IDEAS in tone-harmony and finish, applied to beautiful groups of furniture. The groups include authentic reproductions of period designs and finishes, as follows:

18th Century Mahogany - Early American Maple - Provincial Walnut - Strip Knotty Pine - Blonde and Pickled Finishes

In addition, Glidden again leads with an entirely new array of panels, showing a wide range of woods and finishes, applied to case goods, dining room and bed room sets. Also a complete line of Glidden-finished household furnishings and appliances is being shown. In constant attendance are an expert furniture finisher, and a man trained in the application of Glidden Systemized Colors, for reliable consultation service. Don't fail to visit Space 544 D!

THE GLIDDEN COMPANY - National Headquarters: Cleveland, Ohio

Factories in: READING, PA. CHICAGO ST. LOUIS MINNEAPOLIS

GLIDDEN

Everywhere on Everything

GLIDDEN PRODUCTS NOW CARRY THE FAMOUS "TIME-TESTED" MARK OF QUALITY

Factories in: NEW ORLEANS SAN FRANCISCO LOS ANGELES TORONTO, ONT.

or any commercial wax remover.

To produce the tarnished effect in the low grooves, dip the casting into acid that has been well diluted with water; then allow to dry until the desired effect is reached. Then rinse the casting in water to kill any further acid action. Polish the high spots on a felt buffing wheel onto which automobile rubbing compound has been applied. This will give a light natural bronze finish on the high spots that will feather edge into dark bronze in the lower grooves. Remove the accumulation of rubbing compound with water, rinse in clean naphtha and apply a thin coat of clear lacquer. When the lacquer is thoroughly dry highlights can be polished on the top ridges with a very light rub on a clean felt buffing wheel.

Various effects can be had by substituting dull clear lacquer for the final coat, or by using clear lacquer to which just enough color has been added to tint it, but not to destroy its transparency. Still another effect can be obtained by tinting varnish for a final coat in place of lacquer. Varnish naturally has a tendency to collect in the deeper grooves, giving them a deeper tint.—H. H. GLINKE.

Care of Brushes

In reply to a recent inquiry on how to keep paint, varnish, enamel, shellac and stain brushes in best of condition, here are my suggestions:

After examining various brush containers, I have finally come to the conclusion that the best results are obtained by drilling holes through the handles of the finishing brushes large enough to insert a steel wire. The wire should be long enough to be laid across the solvent containers. The top can be cut from a one-gallon thinner or varnish can and the container then can be used to segregate the various types of finishing brushes. The holes should be drilled at the point in the handle, that will allow the brush to be suspended at least 2-in. above the bottom of the container .... so the bottom of the bristles will not come into contact with the sediment which collects in the bottom of the container.

My reason for recommending individual containers for each type of brush is that the sediment and thinner can be removed without having to handle a large container with a number of compartments. The entire group of containers may be placed in a covered master container to avoid dust and evaporation, which is placed in the coolest part of the finishing room.

If slow-drying solvents are used to preserve the brushes you will note much less evaporation.

Lettering brushes, striping quills, etc., should be cleaned thoroughly as soon as possible after the job is completed. Then apply a liberal coating of petroleum jelly to the bristles. At the same time straighten and form the bristles. They should be kept in a box that is long enough to avoid cramping the bristles when they are laid flat in the box.

For varnish brushes I recommend a solvent of turpentine with a small amount of clear varnish and linseed oil added. Shellac brushes are best kept in alcohol. Synthetic enamel and lacquer brushes should be kept in slow-drying thinner with a small amount of retarder added. Stain

brushes can be placed in the solvent which is used as their reducer. New brushes should be kept in moth balls.

The time and money spent in properly caring for good brushes will be saved many times over in brush replacement costs and fewer rejects.—H. H. GLINKE.

To Kill Grain of Fir Wood

In reply to that inquiry on page 55 of the November issue, asking how to kill the grain of fir wood which is to be painted:

Taking into consideration the natural alternate very soft and very hard layers of grain that must be overcome in finishing fir wood, and still keeping an eye on excessive production costs, I have found a method that in my opinion is the most economical.

First, instead of filling the grain with filler or undercoater, which has a natural tendency to lift the grain, I have found that if you shoot the bare surface with a fog coat of shellac diluted 50/50 with alcohol you can save a lot of labor and material. When shooting the fog coat, hold your spray gun about 12-in. away from the work, so that the fog coat is applied somewhat dry. By not shooting wet and not piling the shellac on, you will lift the grain only slightly. When the fog coat is thoroughly dry, sand lightly to remove any slight fuzz. Remember, shellac is deceiving; it may appear to be dry and yet require much more drying time.

The second coat of shellac need not be diluted quite as much as the first; use about one-third thinner. If the shellac fog coats are

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applied correctly and allowed plenty of time to dry, very little surfacer will be necessary.

If there are any hammer marks or dents in the plywood they can now be blazed with a stiff glazing compound. Avoid thin glazing compounds because they shrink when drying. The surfacer should be applied one light coat over another until you are positive that it can be sanded without going through to the bare wood. Should you accidently sand through to the wood in spots, it will be necessary to again seal with shellac and resurface the spots. Otherwise the grain will lift every time a coat is applied.

Let me emphasize that the most important operation is sealing the bare wood properly. And when it is once sealed, keep it sealed.

Before applying the final finish coat, the surfacer should be sealed. To apply the final finish, shoot a fog coat of color; then, when it is thoroughly tacky, shoot a slow heavy wet color coat.—H. H. GLINKE.

Work Table Finish

We manufacture laminated hard-maple work-table tops for homes; also drain-boards and sink tops. We would like to have your suggestions on what would be the best finish for a household work table which occasionally becomes wet. This finish, if not waterproof, should at least be water resisting. We would like to keep a natural wood finish.

We have tried many finishes with varied success and we thought you could possibly give us some suggestions as to what finish would be most suitable and

practical for this wood and for this purpose.—D. & M. Co.

EDITOR'S NOTE: In reply to the foregoing question, the technical research laboratories of one manufacturer recommend the following system:

1) Sand the bare maple until maximum smoothness is obtained.

2) Apply one brush coat of water-resisting varnish reduced in the proportion of five parts of varnish to one part of turpentine. This coat should be brushed in well on all sides and ends to insure complete sealing against further moisture.

3) Sand or steelwool all exposed surfaces.

4) Apply second coat of varnish reduced as in operation No. 2; allow it to air-dry at least 12 hours.

5) Apply a top coat of varnish without reduction.

While the varnish may be sprayed, the brush method is favorably considered because it assists in working the first coat of varnish into the wood, with benefits to adhesion and sealing properties.

A compound is now available for flameproofing of any fabric.

To Finish Ebony

The generally accepted method of finishing ebony is to wax and polish the bare wood. The use of a felt buffing wheel will give a rich polished effect that enhances the natural beauty of the ebony.

There is also a method known as the "boiling out process" which is sometimes used. This is to heat the ebony to 200°F. in an oven. While the ebony is still hot, scrub briskly with warm thinner. A clear coat of shellac, varnish or lacquer can then be applied, followed with waxing and polishing. While this later method gives a bright finish with much less polishing it will not give the service that the hand waxing on the bare wood gives.—H. H. GLINKE.

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Harmful Finger Prints
ON METAL TO BE FINISHED

by Louis Nagel

Some finishes are marred by the acid perspiration of finger prints made on the steel previous to or during fabrication, even though the metal goes through a cleaning operation before it is finished.

IT IS in connection with crime control efforts that most persons think of finger prints, but finger prints have another meaning to those of us who put industrial paints on steel. Who would guess that touching a sheet of steel could cause a painting problem?

True enough, finger prints are not a nuisance that is common but when they do occur they can be serious. The resulting defect is not extremely conspicuous on a low-standard job where it may even pass unnoticed. But with a high class finish, especially one that is very smooth and glossy, it can stand out obtrusively.

Examination shows that the phenomenon is not a color effect —or not entirely so; and it is not caused simply by incomplete hiding or "look-through." It is more like a surface disturbance or undulation.

If that surmise is correct then probably the finger touch has not merely stained the metal but has also etched it. That this hypothesis is correct is indicated by other observations. For instance, the writer has seen panels which, after fabrication and before painting, have gone through a naphtha wash and then a burn-off operation. Even though paint-spraying and baking followed at once there were finger print defects present.

Upon checking back, these finger prints were found to be present on the fabricated pieces as they arrived in the finishing department. But their frequence and numbers did not account for all the hands that had touched the steel during the manufacturing processes. Hence, only some of the many hands were responsible; and on those there was unquestionably some substance that attacks steel. Further investigation disclosed that the substance was not always a chemical or material incident to one of the manufacturing steps. It proved to be sweat, not ordinary sweat but an unusually corrosive kind.

Apparently there was one man who was an extraordinarily proficient finger-printer. Which man?

At first it would seem easy to let the print, by its distinctive pattern, identify its producer. But for obvious reasons, with which most of us are sympathetic, many persons resent being finger-printed. And in these CIO times the tactful plant executive avoids disgruntling methods. So, the best way, perhaps, though rather time-consuming, is through shifting the pre-paintshop workers till, by elimination, the unwittingly responsible author of the trouble is made known.

Of course, if the finishing schedule includes filling, surfacing, and sanding operations, then finger prints do not show up; nor do they occur if the metal is cleaned by means of sandblasting. Perhaps the various phosphoric, chromic, and other acid-treat processes are equally effective. The writer would be glad to hear the experiences of users; and about the several alkaline-cleaning methods, too.

If the finish to be applied is one of the currently popular artistic effects, such as crystal, wrinkle, or ripple, then any of the above mentioned steel-cleaning methods is successful and there will not be any finger prints.

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The dehumidifier illustrated in the bulletin is enclosed in a sheet-metal cabinet which can be placed singly or in multiple in the room wherein air is to be conditioned.

Auxiliary equipment includes a regenerator, cooling coil, heating coil, a reservoir of lithium chloride, and a pump. A solution of lithium chloride is the moisture absorbing agent.

In the process of absorbing water vapor, the lithium chloride temperature rises, due to the liberation of the latent heat of condensation of the vapor plus the slight heat of dilution of the solution. This heat is easily removed by cooling the solution with ordinary water. No special water is necessary and refrigeration is not required. The temperature of the dehumidified air also may rise a few degrees. In some industrial applications, this constitutes a distinct saving of steam required to heat the air to usable temperature.

Because it is a very simple matter to regenerate the lithium chloride solution, it is used in a continuous dehumidifying cycle. In order to keep the solution at the proper strength, all that is necessary is to heat a portion of the solution in a current of air. Under these circumstances, it gives off the moisture which it absorbed from the air while conditioning same for process use. The regenerator is automatically

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controlled by an electrical device which is set to maintain the desired specific gravity of the solution. In this way regenerating energy is used in direct proportion to operating requirements.

Letters from I. F. Readers

(Continued from page 11)

Flock Finish Over Silk Screened Sizing

We are interested in receiving more information regarding the "Flock Finish for Silk Screen," as mentioned in February issue of INDUSTRIAL FINISHING magazine, page 68.—U. A. Co.

Finishing Croquet Sets

Can you tell us what methods of finishing are used in the manufacture of croquet sets? And will you advise us if machines are available for striping work? Also, varnishing machines that can be used in finishing handles, etc.

We would like facts concerning gasket dipping and any approved method of painting or finishing which might be applied to our work.—H. & O. Co. (Wooden Novelties)

Rubber-Base Finish

Who makes a flexible finish for metal in a variety of colors? We prefer one with a rubber base that is air-drying, not bake. We have a place for it. Advice from INDUSTRIAL FINISHING magazine has saved our skins dozens of times, and I believe it can do so this time.—C. G. L. Co. (Novelty Items).

Graining Paper

In the November issue of INDUSTRIAL FINISHING, in the article "Finishing Cigarette Cases", by L. E. Dexter, we are interested in the reference to the use of transfer paper for graining wood imitations.

We would appreciate knowing who makes the paper referred to. We have attempted to use graining paper on hospital tables, but have not found any except a coarse grain paper. It seems probable that a grain suitable to use on cigarette cases would be adaptable to our use.—A. R. J. Co. (Furniture Specialties).

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222 East Ohio St., Indianapolis, Ind.
Telephone .....Riley 6771

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EDITORIAL

Off-Color Troubles

A number of possible conditions can cause off-color troubles in air-drying enamels that are used on wood or metal, but one of the first places to look for the cause is in the stirring or non-stirring of the enamel when it is used. When paint or enamel is allowed to remain still for a short while, some of the pigment will settle to the bottom of the container—and often this is just what happens in the finishing room. It can happen in spraying, dipping or brushing—and it will happen unless suitable precautions are taken.

Recently we came across some trouble of this kind where high-class products were being manufactured. The finishing foreman had wasted considerable time and material and did a great deal of worrying before he discovered that his off-color trouble was due to the fact that the enamel had not been stirred or agitated to preserve a thoroughly uniform mixture. What he needs is a small air-motored agitator for his gravity-feed container, or some other device, mechanical or manual, to keep the enamel stirred and thoroughly mixed.

Lacking a suitable stirrer and being hesitant about requesting his company to purchase one, this finishing foreman has resorted to the use of cup spray guns. The enamel is thoroughly stirred in the large container (or it is supposed to be) before the spray cups are filled. The movements of the spray operator in handling the cup gun are such that the contents of the cup are kept sufficiently agitated during spraying to prevent any settling of the pigment.

Naturally, this is somewhat of a makeshift remedy. It calls for more frequent interruptions in each spray operator's work to fill his quart-size container repeatedly and, every time before filling the cup, he is obliged to stir the contents of the larger container which holds the supply of enamel.

The foreman declares that he can not depend upon the spray operators to stir the contents of their gravity-feed containers often enough during spraying to keep the material thoroughly mixed, so that no excess pigment

will settle to the bottom. However, the spray men will stir the contents of the container just before filling the small cup attached to their spray guns.

What this concern should have is a pressure container equipped with either a manual or air-motored device for stirring the contents to keep the material uniformly mixed during spray operations. Uniformity in the mixture of a finishing material is absolutely necessary when it is being applied as a coating to any surface. Otherwise there will be a lack of uniformity in the finish—not only in the color but in the texture and thickness of the film and in the durability of the coating.

Note: The Editor will welcome letters or articles about other finishers' off-color troubles or experiences.

Little Things Count—Toward a Quality Finish

Among the several interesting things we saw recently while visiting a few industrial finishing rooms, one that impressed us was a one-coat white-enamel bake finish on steel kitchen cabinets. It was a remarkably smooth full-coverage white that is claimed to be satisfactory in durability, toughness, hardness, etc. The work is done in a small factory.

The steel cabinets are cleaned with a chemical cleaner which is brushed on and then wiped off carefully. The enamel is sprayed on with equipment that is kept clean and in first-class condition; then the finish is baked for about three hours at 200°F.

One of the small things in the finishing process—one that might easily escape notice—is the fact that in addition to the white enamel being thoroughly stirred before using, it is also carefully strained through cone-shaped strainers made especially for this purpose. The foreman is particularly careful about this straining of every bit of enamel he uses—and he declares that this is an important item contributing toward the uniformly smooth finish he is getting.

Clean compressed air and cleanliness all along the line of production finish also contribute to the excellent appearance of this one-coat finish of white enamel. Of course, skilled and experienced workmanship and a quality enamel are also contributing factors toward the final result. There should be more of this close attention to details in every metal-cleaning and finishing department. Then we would attain more satisfactory finishes at less cost in materials, less labor and less grief for everyone concerned.

* * * INDUSTRIAL FINISHING wishes all of its friends a Merry Christmas and a very Happy Prosperous New Year

A Frightened Foreman

Ever meet a scared finishing foreman? We mean one who is or appears to be always afraid to ask for what he really needs in order to turn out quality work economically and within reasonable time.

Without dwelling upon the sentimental side of it, or inquiring into who may be responsible for such a condition, let's look into some of the results. Here is something we noticed in one place: Off-color trouble in light-tinted enamels — partly because there were no agitating or stirring devices for the material container to keep the materials thoroughly stirred; partly because of evaporation of solvents from material in an open gravity bucket; and partly because no facilities were available for accurately measuring or maintaining a uniform viscosity of the enamel sprayed.

This foreman was afraid to ask for the little equipment he needed to prevent this trouble, therefore his way out was to refinish several expensive pieces of professional furniture, and then turn to the use of cup guns for spraying subsequent production runs of furniture finished in this enamel.

He needed a number of other things that he was afraid to ask for, and as a result there were more wastefulness and makeshifts which cost him a lot of worry and his company a great deal of money.

Some day, probably, an energetic progressive man will come into that plant and sell the management on all of the uptodate and complete equipment and methods they need, after which they will notice a great deal of difference in their cost of finishing per unit —and then they will probably blame that scared foreman finisher for not being progressive and abreast of the times in his knowledge and methods.

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The metal to be used in a particular dipping basket is determined by the cleaning or finishing schedule. It depends largely upon such factors as the size and shape of parts to be treated, character and strength of the solution or finishing material, method of han-

dling, temperature, possible galvanic action, etc. With essential facts specified, an expert will be able to recommend the basket best suited to the work.

Quoting from the company's bulletin:

As a general guide, the chemical action on several commonly used metals is given herewith:

ALUMINUM is light in weight and of great strength in special alloys. Under ordinary temperatures aluminum will withstand the action of nitric or sulphuric acids, but it is attacked by all alkalis and by hydrochloric and hydrofluoric acids in any concentration; fine for bright dipping.

BRASS AND COPPER: Copper resists the sulphuric acid commonly used in pickling solutions. It is attacked by oxidizing acids such as nitric. Brass will withstand the same acids as copper, but the resistance is not as great as in copper. Brass and copper are readily attacked by ammonia and ammonia salts. Brass containing more than 20% zinc should not be used in such operations because the higher percentages are subject to dezincification. Brass may be used in alkali solution except cyanide. It is not attacked by hydrofluoric acid; it can also be used in dilute solutions of sulphuric or hydrochloric acid. Brass is attacked by hot concentrated sulphuric or hydrochloric acids, also nitric acid in any concentration.

MONEL METAL is a natural noncorrodible alloy of nickel and copper. It is not attacked to any appreciable extent by alkalis, brine, alcohol or hot gases, and is moderately resistant to all common acids except nitric, for which it is entirely unsuitable. Monel metal has the additional advantage of great strength, and where erosion is encountered, it is tougher than steel and costs less than pure nickel.

NICKEL—99% pure—is highly resistant to alkalis and to most acids except nitric, and hot gases containing sulphur. Where other hot gases or high temperatures prevail, nickel is superior to other alloys not combining so great a natural density, fibrous structure and smooth surface.

NICKEL CHROMIUM ALLOY (Alloy "C") is highly resistant to all commercial acids and high temperatures. It is satisfactory up to 1600°F. Although initially higher in price compared to other metals, its lasting qualities make it very economical over a period of time. This alloy is used principally in cycles embodying both an alkali process and a bright dip containing nitric acid. It is not attacked by alkalis and is moderately resistant to all the common acids. It has exceptional strength and is not affected by ordinary high heat.

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STAINLESS STEEL refers to a group of chromium and steel alloys which resist corrosion from practically all solutions excepting hydrochloric and hydrofluoric or pure sulphurous acids, bromine iodine and acqueous solutions of a few compounds of the halogen acids or pure sulphurous acid. It must also be remembered that corrosion resistance is largely influenced by galvanic action when in contact with other metals.

IRON is most commonly used in alkali solutions, as it resists these.

DeVilbiss Respirators

Respirators or breathing filters for men to wear when they work in poorly ventilated areas, or where dust or fumes are excessively heavy, are illustrated and described in a 3-color folder being distributed by the DeVilbiss Co., Toledo, Ohio. Four different type filters are shown. Some of them are especially designed to wear where paints are lacquers are being sprayed—and where workmen are confronted with the dust made by sanding, wire brushing, grinding, buffing, etc.

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Rudd Lacquer & Sealer Corp. Organized in New York

Organization of the Rudd Lacquer & Sealer Corp., with Mr. J. F. Rudd as Vice President in charge of development and production, is announced. Offices are at 80 Cliff St., New York, N. Y. A modern lacquer factory with a capacity of 6000 gallons of lacquers and sealers per day, is located at Rahway, N. J. The company plans to specialize on clear lacquers and sealers.

Mr. Rudd has had 20 years experience in this field. He was formerly chief chemist and superintendent of the Jamestown Woodfinishing Co., Jamestown, N. Y. (1920 to 1924), and later was in charge of the lacquer division of John W. Masury & Son, Brooklyn, from 1925 to November 1 of this year.

"Neoprene"—Better Than Rubber

Neoprene, an enigineering material with rubber-like properties, yet one which resists the deteriorating effects of oil, heat, sunlight, chemicals and oxidation, is described in detail in a new handbook published by Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Wilmington, Del. This presentation considers separately the effects of various types of oils, acids, sunlight, heat and other forces which result in rapid deterioration of rubber products and indicates the type of service which may be expected with a similar part of neoprene.

Tinted Pigment for O. S. Paints

A booklet devoted to "Ti-Tint," a tinted titanium dioxide pigment for colored exterior paints has just been issued by the Krebs Pigment and Color Corp., a subsidiary of E. I. du Pont de Nemours & Co. The publication summarizes the properties of titanium dioxide pigments, describing the nature of the tinted product, which has been made available in buff and gray. Its primary purpose in keeping exterior paints from fading is likewise discussed.